

CLAIMS

1. A surgical instrument, comprising:
a handle assembly;
an end effector carried by the handle assembly and operable by the handle
assembly;
a first handle included in the handle assembly;
a second handle included in the handle assembly and pivotal on the first
handle at a fulcrum;
10 a female bayonet fitting disposed at the fulcrum on the first handle;
male bayonet fitting disposed at the fulcrum on the second handle;
the female bayonet fitting and the male bayonet fitting having a first
relative position permitting assembly and disassembly of the first handle and the second handle,
and a second relative position permitting pivotal movement of the first handle relative to the
second handle to facilitate operation of the end effector.
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2. The surgical instrument recited in Claim 1, wherein:
the handle assembly has an open position and a closed position; and
the first relative position is in proximity to the open position

3. The surgical instrument recited in Claim 2, wherein:
the second relative position is disposed between the open position and the
closed position.

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4. The surgical instrument recited in Claim 1, wherein:

the female bayonet fitting includes first portions defining a whole and including a pair of first opposing flanges extending radially inwardly of the whole;

the male bayonet fitting includes second portions defining a cylinder and

5 including a pair of second opposing flanges extending radially outwardly between the pair of first opposing flanges in the first relative position.

5. The surgical instrument recited in Claim 1, further comprising:

means disposed on the handle assembly for inhibiting relative movement of the female bayonet fitting and the male bayonet fitting from the second relative position to the first relative position.

6. The surgical instrument recited in Claim 5 wherein the inhibiting means comprises a pin fixed to the female bayonet fitting to inhibit pivotal movement of the male bayonet fitting to the first relative position

7. The surgical instrument recited in Claim 6 wherein the pin is removable from the female bayonet fitting to permit movement of the male bayonet fitting to the first relative position and thereby facilitate disassembly of the handle assembly.

8. The surgical instrument recited in Claim 1 wherein the handle assembly is machined to form the female bayonet fitting and the male bayonet fitting.

9. The surgical instrument, comprising:
a handle assembly;
an end effector carried by the handle assembly and operable by the handle
assembly;

5 a pair of handles included in the handle assembly and being pivotal
relative to each other at a fulcrum which divides the handle assembly into a proximal end and a
distal end;

a pair of finger rings included in the proximal end of the handle assembly.

10 a pair of handle bars included in the proximal end of the handle assembly,
each of the handle bars extending more than one-half the distance between the fulcrum and an
associated one of the finger rings.

the handle bars being disposed relative to each other to intersect at an
imaginary apex other than the fulcrum.

10. The surgical instrument recited in Claim 9, further comprising:;
at least one ridge formed along one of the handle bars to facilitate finger
placement when the instrument is palmed by a user

11. The surgical instrument recited in Claim 9, wherein:
the handle bars are disposed relative to each other to define a first angle at
the imaginary apex when the handle bars are in a closed position and to define a second angle at
the imaginary apex when the handle bars are in an opened position.

12 The surgical instrument recited in Claim 11 wherein the imaginary apex moves proximately as the handle bars move from the closed position toward the opened position.

13. The surgical instrument recited in Claim 12 wherein the imaginary apex is disposed distally of the fulcrum, in both the opened position and the closed position.

14. The surgical instrument recited in Claim 9, further comprising:
a bayonet coupling disposed at the fulcrum and permitting pivotal movement of the handles at the fulcrum.

15. The surgical instrument recited in Claim 9 wherein:
the handles have an intermediation disposed between the proximal end and the distal end; and
the handles at the intermediate section have a cross sectional area less than
5 that of the proximal end and the distal end.

16. A surgical instrument, comprising:
a handle assembly;
a cartridge of surgical staples removably attached to the handle assembly

an operable by the handle assembly.

5 a first handle and a second handle included in the handle assembly and
being pivotal at a fulcrum and relative to an axis, between an open position and a closed position;

a first flange fixed to the first handle and extending inwardly toward the
second handle, the first flange including portions defining a first slot;

10 a second flange fixed to the second handle and extending inwardly toward
the first handle, the second flange, including portions defining a second slot;

the first slot being disposed at an angle to the second slot and intersecting
the second slot at a point of operation between the open position and the closed position of the
handles; and

15 an operating pin included in the cartridge and disposed in the slots at the
point of operation to operate the cartridge as the handles move between the open position and the
closed position.

17. The surgical instrument recited in Claim 16 wherein the first slot is
defined at a constant angle relative to the axis.

18. The surgical instrument recited in Claim 16 wherein the first slot is non-
linear with respect to the axis.

19. The surgical instrument recited in Claim 16 wherein the first flange is guided by the second flange.

20. The surgical instrument recited in Claim 19, wherein:
the first flange is disposed in a first plane.
the second flange is disposed in a second plane generally parallel to the first plane; and

5 the first flange is guided by the second flange to prevent movement of the first flange relative to the second flange in a direction transversed to the first plane.

21. The surgical instrument recited in Claim 20 wherein the first flange slides on the second flange along a plane which passes through the axis of the handles.

22. The surgical instrument recited in Claim 16 wherein the operating pin moves with a timing, direction and force dependent on the shape of the first slot relative to the second slot.

23. The surgical instrument recited in Claim 20 having a length along the axis, and further comprising:

5 a first point of stability located in proximity to the flanges;
a second point of stability located in proximity to the fulcrum; and
the first point of stability being spaced from the second point of stability, a distance greater than one half the length of the instrument along the axis.

24. The surgical instrument, comprising:
a handle assembly;
a first handle and a second handle included in the handle assembly, the
first handle being moveable at a pivot point on the second handle between an open position and a
5 closed position;

a first flange carried by the first handle and extending toward the second
handle, the first flange having a first planar surface;
a second flange carried by the second handle and extending toward the
first handle, the second flange having a second planar surface.

10 the first planar surface of the first flange slidably engaging the second
planar surface of the second flange to define a point of stability inhibiting movement of the first
flange in a direction transverse to the second planar surface.

25. The surgical instrument recited in Claim 24 wherein the point of stability
is a first point of stability, and the stapler further comprises:
a second point of stability disposed in a spaced relationship with the first
point of stability.

26. The surgical instrument recited in Claim 25 wherein:
the instrument has a length measured along an axis; and
the second point of stability is separated from the first point of stability a
distance greater than one-half the length of the instrument.

~~27~~ A surgical instrument, comprising:
a handle assembly;
a first handle included in the handle assembly;
a second handle included in the handle assembly and being moveable on
5 the first handle at a pivot point dividing the handle assembly into a proximal end and a distal
end, the first handle being rotatable relative to the second handle between an open position and a
closed position;

overdrive protectors included in the stapler for preventing rotation of the
handles beyond the closed position;

10 a first overdrive protector disposed at the distal end of the handle
assembly;
a second overdrive protector disposed at the proximal end of the handle
assembly; and
a third overdrive protector disposed on the cartridge.

28. The surgical instrument recited in Claim 27, further comprising a bayonet
coupling disposed at the pivot point of the handle assembly.

29. The surgical instrument recited in Claim 27, further comprising:
a leaf spring disposed between the first handle and the second handle to
bias the handle assembly to the open position.

30. The surgical instrument recited in Claim 29 wherein the leaf spring has a first end and a second end and the stapler further comprises:

first portions of the leaf spring at the first end being attached to the first handle; and

5 second portions of the leaf spring at the second end defining a hole; and
 a hook carried by the second handle and removably engaging the hole in
the leaf spring.

31. The surgical instrument recited in Claim 1, wherein the end effector is
removably attached to the handle assembly.

32. The surgical instrument recited in Claim 31, wherein the end effector
includes a pair of jaws

33. The surgical instrument recited in Claim 32, further comprising a stapler
cartridge carrying the jaws and being adapted for removable attachment to the handle assembly.

34. The surgical instrument recited in Claim 33, wherein the cartridge is
adapted for removable attachment to the handle assembly at the fulcrum.

35. A surgical instrument, comprising:

A non-disposable portion including a handle assembly with arms having first alignment characteristics;

a disposable portion carried by the handle assembly and including end effectors with second alignment characteristics;

the end effectors being disposed relative to the arms and having a floating relationship with the arms; whereby

the second alignment characteristics of the end effectors are independent of the first alignment characteristics of the arms.

36. The surgical instrument recited in Claim 35, wherein:

The non-disposable portion includes a fulcrum and;

the disposable portion is releasably attached to the non-disposable portion at the fulcrum.

37. The surgical instrument recited in Claim 35 wherein the end effectors are disposed between the arms.

38. The surgical instrument recited in Claim 35, wherein:

the end effectors include a first end effector and a second effector

cooperating with the first end effector to produce an end effect; and

the first end effector having a pivotal relationship with the second end

5 effector.

39. The surgical instrument recited in Claim 38, wherein:

the fulcrum of the non-disposable portion is a first fulcrum; and

the first end effector pivots relative to the second end effector at a second

fulcrum.

40. The surgical instrument recited in Claim 39 wherein the first fulcrum is different from the second fulcrum.

41. The surgical instrument recited in Claim 40 wherein the first fulcrum is spaced from the second fulcrum.

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The surgical instrument recited in Claim 41 wherein the first fulcrum has a first axis and the second fulcrum has a second axis different than the first axis.